WHAT IS CLAIMED IS:

1. An apparatus for treating an air flow containing particulates and/or oxidized compounds of carbon, sulfur, iron, and other elements, comprising:

a receptor having an inner surface;

an electrode node having a body with an outer surface spaced from the inner surface of the receptor to define a reaction zone between the outer surface of the body and the inner surface of the receptor;

a plurality of electrically conductive point source electrodes projecting from the body of the electrode node into the reaction zone;

the electrode node and the receptor being electrically isolated from each other and the inner surface of the receptor being connected to ground;

a voltage source electrically connected to the electrode node; and

means for introducing the air flow into the reaction zone.

2. The apparatus of claim 1 in which the electrode node body comprises a series of interconnected electrically conductive frames.

3. The apparatus of claim 2 in which conductive tiles are mounted on the frames to produce a cone-shaped structure.

4. The apparatus of claim 3 in which the point source electrodes project from the tile surfaces into the reaction zone.

5. The apparatus of claim 1 in which the electrode node body has an inner surface that is covered with electrically conductive material.

6. The apparatus of claim 5 in which the electrically conductive material is an aluminum foil.

7. The apparatus of claim 1 in which the point source electrodes are integrated in a common electrical circuit.

8. The apparatus of claim 1 in which the point source electrodes are needle electrodes.

9. The apparatus of claim 8 in which the spacing between adjacent needles is no less than about 20 mm and no more than about 45 mm.

10. The apparatus of claim 8 in which the electrode node body has an outer surface area of about 22 m^2 with approximately 17,000 needles of about 0.35 mm diameter projecting from its surface, the needles being spaced at about 22 mm between adjacent needles.

11. The apparatus of claim 8 in which the needle shafts protrude about 40 mm from the outer surface of the body of the electrode node.

12. The apparatus of claim 1 in which the voltage source is a transformer.

13. The apparatus of claim 12 in which the transformer provides a voltage in the range of about 10 – 3,000 kV through a rectifier.

14. The apparatus of claim 12 in which the transformer produces a voltage in the range of about 300 kV and a current of about 250 mA, through a rectifier.

15. The apparatus of claim 1 in which the receptor is funnel-shaped, having a conical inclined inner surface.

16. The apparatus of claim 15 including a means for supplying a continuous film of electrically-grounded water on the inner surface of the receptor.

17. The apparatus of claim 16 in which the outer edge of the receptor is encircled by an annular trough continuously supplied with water that spills over the outer edge of the funnel receptor to supply the continuous film of water.

18. The apparatus of claim 16 in which the inner surface of the receptor carrying the water film is covered with an insulating coating.

19. The apparatus of claim 18 in which the insulating coating is an epoxy filled with dielectric particles.

20. The apparatus of claim 16 including means for collecting the water traveling over the inner surface of the receptor and means to filter the collected water to remove particulates and elemental material.

21. The apparatus of claim 20 including an air flotation system for filtering the collected water.

22. The apparatus of claim 1 in which the reaction zone is about 5 m in thickness.

23. The apparatus of claim 1 including means for moving the electrode node body with respect to the receptor in order to vary thickness of the reaction zone.

24. The apparatus of claim 1 in which the electrode node body and receptor are bowl-shaped.

25. The apparatus of claim 1 in which the corresponding outer surface of the electrode node body and the inner surface of the receptor are substantially equidistant from each other and the electrode node body and receptor are symmetrically disposed about a common axis.

26. The apparatus of claim 1 including means for recycling the air flow introduced into the reaction zone.

27. The apparatus of claim 1 including means for introducing the air flow from the lower part of the receptor.

28. The apparatus of claim 1 including means for accelerating the air flow as it enters the reaction zone.

29. A method for treating an air flow containing particulates and oxidized compounds of carbon, sulfur, iron and other elements, comprising the steps of:

supplying an airflow to a reaction zone formed between an electrode node having a plurality of point source electrodes and a receptor connected to ground, the electrode node and receptor being electrically insulated from each other and ;

applying a voltage to the point source electrodes;

supplying a continuous film of electrically grounded water on the surface of the receptor; and

filtering the water after it travels over the surface of the receptor to collect elemental materials formed in the reaction zone.

30. The method of claim 29, wherein the point source electrodes are needle electrodes.

31. The method of claim 29, wherein atomic hydrogen is produced by unipolar ionization at the point source electrodes, to reduce the oxide compounds in the reaction zone.

32. A method for treating the emissions of a coal-fired plant to improve its efficiency by recovering carbon from the plant emissions and reusing the recovered carbon as fuel, comprising:

supplying an air flow containing carbon compounds from the emissions of a coal-fired plant to a reaction zone formed between an electrode node having a plurality of point source electrodes and a receptor connected to ground, the electrode node and receptor being electrically insulated from each other;

applying a voltage to the point source electrodes;

supplying a continuous film of electrically-grounded water on the surface of the receptor;

filtering the water after it travels over the surface of the receptor to collect the carbon produced in the reaction zone; and

adding the collected carbon to the coal fuel.

33. The method of claim 32, wherein the point source electrodes are needle electrodes.

34. The method of claim 32 in which the air flow is cooled to at least about 60°C before it enters the reaction band.

35. A method for reducing waste in waste landfills by incinerating the waste and landfilling the resulting elemental material having a diminished volume compared to the initial waste, comprising:

burning waste in an incinerator to produce an air flow containing oxides of carbon, sulfur, iron and other elements;

supplying the air flow from the incinerator to a reaction zone formed between an electrode node having a plurality of point source electrodes and a receptor connected to ground, the electrode node and receptor being electrically insulated from each other;

applying a voltage to the point source electrodes of the injector;

supplying a continuous film of electrically-grounded water on the surface of the receptor;

filtering the water after it travels over the surface of the receptor to collect the elemental materials produced in the reaction zone; and

landfilling the collected elemental materials.

36. The method of claim 35, wherein the point source electrodes are needle electrodes.

37. A method for producing fullerenes, comprising:

supplying an air flow containing oxidized carbon compounds to a reaction zone formed between an electrode node having a plurality of point source electrodes and a

receptor connected to ground, the electrode node and receptor being electrically insulated from each other;

applying a voltage to the point source electrodes of the injector;

supplying a continuous film of electrically-grounded water on the surface of the receptor;

filtering the water after it travels over the surface of the receptor to collect the carbon produced in the reaction zone; and

separating fullerenes from the collected carbon.

38. The method of claim 37, wherein the point source electrodes are needle electrodes.

39. The method of claim 37 wherein atomic hydrogen is produced by unipolar ionization at the point source electrodes to reduce the carbon compounds in the reaction zone and produce carbon.

40. The method of claim 35 in which the oxidized carbon compounds are produced by burning a hydrocarbon fuel or paraffin.